

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 78-18

NPDES NO. CA0005134

WASTE DISCHARGE REQUIREMENTS FOR:
CHEVRON, USA, RICHMOND REFINERY
RICHMOND, CONTRA COSTA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter called the Board) finds that:

1. The Board, on November 19, 1974, adopted Order 74-151 prescribing waste discharge requirements for the Standard Oil Company of California (now Chevron, USA), Richmond Refinery (hereinafter called the discharger). The discharger has asked the Board to revise its requirements by letters of April 1 and June 30, 1977.
2. The discharger operates a petroleum refinery which produces fuels, oils, and petrochemicals from 365,000 barrels per day of crude oil. The process wastewater is combined with once-through cooling water and is discharged to Castro Creek 500 yards from its confluence with Castro Cove, an embayment of San Pablo Bay, about 3000 yards south-east of Point San Pablo in Richmond, California. Castro Creek, Castro Cove and San Pablo Bay are waters of the United States. Waste 001 is about 12.5 mgd of refinery process waste. During wet weather Waste 001 includes storm runoff from refinery process areas and a small area of adjacent residential development. Waste 002 is about 90 mgd of once-through cooling water. The combined mixture of Wastes 001 and 002 is discharged to Castro Creek.
3. The Board, in April 1975, adopted a Water Quality Control Plan. The Plan contains water quality objectives for San Pablo Bay and its tributaries. The Basin Plan includes the following prohibitions:

"...It shall be prohibited to discharge:

 1. Any wastewater which has particular characteristics of concern to beneficial uses:

... ..
 - b. At any point at which the wastewater does not receive a minimum initial dilution of at least 10:1.
 - c. Into any nontidal water or dead-end slough or slough or similar confined water areas or their immediate tributaries. ..."
4. The Basin Plan provides that exceptions to these discharge prohibitions may be granted for certain wet weather and other discharges:
 - a. Having a high initial dilution

- b. Where an inordinate burden would be placed on the discharger relative to beneficial uses protected
 - c. When an equivalent level of environmental protection can be achieved by alternate means.
5. The discharger is currently achieving an initial dilution of 3.5:1 to 8:1 by mixing process waste waters with cooling water.
 6. The discharger has submitted estimates showing that costs of various alternative methods of compliance with the discharge prohibitions described above vary between \$5 million and \$17 million.
 7. The discharger has submitted a report "Impact Assessment of Alternative Locations for Discharging Refinery Process Wastewater" dated April 1976 which shows that substantial improvement of the biological community in the receiving waters of Castro Cove and Castro Creek has taken place over the past several years as a result of improved treatment of wastewaters. The report did not demonstrate achievement of an equivalent level of environmental protection as required by the Basin Plan to justify an exception. However, in view of improvements made to the waste treatment system since the preparation of the report, it may be possible with further studies to demonstrate that such a level of protection is being provided.
 8. The beneficial uses of Castro Creek and San Pablo Bay are:
 - a. Recreation
 - b. Fish migration and habitat
 - c. Habitat and resting for waterfowl and migratory birds
 - d. Industrial water supply
 - e. Esthetic enjoyment
 - f. Navigation
 - g. Shellfish habitat
 9. Effluent limitation and toxic effluent standards established pursuant to Sections 208(b), 301, 304, and 307 of the Federal Water Pollution Control Act and amendments thereto are applicable to the discharge.
 10. The Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
 11. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.
 12. This Order shall serve as a revised National Pollutant Discharge Elimination System permit pursuant to Section 402 of the Federal Water Pollution Control Act, or amendments thereto, and shall take effect at the end of ten days from date of hearing provided the Regional Administrator, U. S. Environmental Protection Agency, has no objections.

13. This project involves the continued operation of a privately-owned facility with negligible or no expansion of use beyond that previously existing. Consequently, this project will not have a significant effect on the environment based upon the exemption provided in Section 15101, Title 14, California Water Code.

IT IS HEREBY ORDERED, that Chevron, USA, Richmond Refinery, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and the provisions of the Federal Water Pollution Control Act and regulations and guidelines adopted thereunder, shall comply with the Following:

A. Effluent Limitations

1. The discharge of Waste 001 containing constituents in excess of the following limits is prohibited:

<u>Constituent</u>	<u>Units</u>	<u>30-day Average</u>	<u>Maximum Daily</u>
BOD (5-day @ 20°C) 4670	lbs/day	4670	8800
	kg/day	2120	4000
Suspended Solids	lbs/day	3850	6040
	kg/day	1750	2750
TOC	lbs/day	10200	19,400
	kg/day	4660	8800
Oil and Grease	lbs/day	1460	2750
	kg/day	666	1250
	mg/l		15
Phenol	lbs/day	31	63.0
	kg/day	14.1	28.6
Ammonia as N	lbs/day	1730	3780
	kg/day	787	1720
Sulfide	lbs/day	25.5	56.5
	kg/day	11.6	25.7
Total Chromium	lbs/day	17	132
	kg/day	7.6	60
Hexavalent Chromium	lbs/day	5.01	11.4
	kg/day	2.28	5.18
Settleable Solids	ml/l-hr	0.1	0.5

2. In addition to the 30-day average and daily maximum pollutant weight allowances shown in A.1, pollutant discharges of storm water are permitted in accordance with the following schedule:

Pounds of pollutant per 1,000
gallons of storm runoff dis-
charged through the Outfall.

<u>Constituent</u>	<u>30-day Average</u>	<u>Maximum Daily</u>
BOD (5-day @ 20 °C)	0.21	0.40
Total Suspended Solids	0.17	0.26
TOC	.46	.88
Oil and Grease	0.067	0.126

The total effluent limitation for the discharge is the sum of the stormwater allocation and the lbs/day limits contained in A.1. The total effluent limitation (both maximum and average) is to be computed by the discharger on a monthly basis as shown in Part B of the monitoring program.

3. The discharge of Waste 002 shall not contain a TOC concentration above intake levels in excess of 5 mg/l.
4. The combined discharge of Wastes 001 and 002 shall not have pH less than 6.5 nor greater than 8.5.
5. In any representative set of samples, the combined discharge of Waste 001 and 002 shall meet the following limit of quality:

TOXICITY:

The survival of test fishes in 96-hour bioassays of the effluent shall achieve a median of 90% survival for three consecutive samples and a 90 percentile value of not less than 70% survival of 10 consecutive samples.

6. The daily discharge rate is obtained from the following calculation for any calendar day:

$$\text{Daily discharge rate} = \frac{8.34}{N} \sum_{i=1}^N Q_i C_i$$

in which N is the number of samples analyzed in any calendar day. Q_i and C_i are the flow rate (mgd) and the constituent concentration (mg/l) respectively, which are associated with each of the N grab samples which may be taken in any calendar day. If a composite sample is taken, C_i is the concentration measured in the composite sample and Q_i is the average flow rate occurring during the period over which samples are composited.

7. The 30-day average discharge rate or concentration shall be the arithmetic average of all the daily values calculated using the results of analyses of all samples collected during any 30 consecutive calendar day period. If fewer than four samples are collected and analyzed during any 30 consecutive calendar day period, compliance with the 30-day average limitation shall not be determined.

8. Instantaneous maximum limitations shall be applied to the values of the measurements obtained for any single grab sample.

B. Receiving Water Limitations

1. The discharge of waste shall not cause the following conditions to exist in water of the state at any place:
 - a. Floating, suspended, or deposited macroscopic particulate matter or foam;
 - b. Bottom deposits or aquatic growths;
 - c. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;
 - d. Visible, floating, suspended, or deposited oil or other products of petroleum origin;
 - e. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.
2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State in any place within one foot of the water surface:
 - a. Dissolved oxygen 5.0 mg/l minimum. Annual median - 80% saturation. When natural factors cause lesser concentration(s) than those specified above, then this discharge shall not cause further reduction in the concentration of dissolved oxygen.
 - b. Dissolved sulfide 0.1 mg/l maximum
 - c. pH Variation from natural ambient pH by more than 0.2.
 - d. Un-ionized Annual Median - .025 mg/l
Ammonia (as N) Maximum - .4 mg/l
3. The discharge shall not cause a violation of any applicable water quality standard for receiving waters adopted by the Board or the State Water Resources Control Board as required by the Federal Water Pollution Control Act and regulations adopted thereunder. If more stringent applicable water quality standards are promulgated or approved pursuant to Section 303 of the Federal Water Pollution Control Act, or amendments thereto, the Board will revise and modify this Order in accordance with such more stringent standards.

C. Discharge Prohibitions

1. Discharge of Waste 001 into waters of Castro Creek and Castro Cove is prohibited after December 31, 1983, or three years following the cessation of discharge to Castro Cove of the San Pablo Sanitary District effluent, whichever is later, unless the discharger can show justification for an exception from the Basin Plan Prohibition stated in Finding 3 above.
2. Discharge of Waste 001 after March 21, 1979, is prohibited at any place where it does not receive a minimum initial dilution of at least 10:1. When the process waste contains storm runoff and the flow rate of the process waste and storm water mixture exceeds 9 mgd, the 10:1 dilution requirement is waived if existing storage capability is used to maximize compliance with the dilution requirement.

D. Provisions

1. Neither the treatment nor the discharge of pollutants shall create a nuisance as defined in the California Water Code.
2. There shall be no bypass of untreated wastewater to waters of the State.
3. The discharger shall comply with all sections of this Order immediately upon adoption with the exception of B.2.d. Annual Median, and C.1, and C.2.
4. No later than July 1, 1979, the discharger shall submit a report defining the concentrations of undissociated ammonia at points within Castro Creek and Cove. Based on this report the Board will modify this Order to establish a zone of initial dilution within which compliance with the annual median limitation for undissociated ammonia need not be demonstrated.
5. An exception to Discharge Prohibition described in C.1. above will be considered providing the discharger can meet the conditions listed in Finding 4 of this Order. In order to demonstrate that an equivalent level of environmental protection can be achieved while continuing the present discharge instead of eliminating the discharge to Castro Creek and Castro Cove, the discharger must perform receiving water and benthic studies. Detailed specifications for those studies, acceptable to the Executive Officer, must be developed by the discharger in consultation with staff of the Regional Board and Dept. of Fish and Game. These studies must include a progress report to be submitted following removal of the San Pablo Sanitary District discharge from Castro Cove upon implementation of the West County Agency outfall project and a final report demonstrating that an equivalent level of environmental protection has been achieved.
6. The discharger shall comply with Prohibition C.1. and Provision D.5 according to the following time schedule:

<u>Task</u>	<u>Compliance Date</u>	<u>Submit Report</u>
a. Prepare acceptable specifications for studies	November 15, 1978	December 1, 1978
b. Prepare semi-annual progress reports	(semi-annual between June 30, 1979 and June 30, 1983)	
c. Prepare final report	November 15, 1983*	December 1, 1983*

*or three years following the removal of the San Pablo Sanitary District discharge from Castro Cove, whichever is later.

7. This permit may be modified, or, alternatively revoked and reissued, to comply with any applicable effluent limitation issued pursuant to the order the United States District Court for the District of Columbia issued on June 8, 1976, in Natural Resources Defense Council, Inc. et. al. v. Russell E. Train, 8 ERC 2120 (D.D.C. 1976), if the effluent limitation so issued:
 - (1) is different in conditions or more stringent than any effluent limitation in the permit; or
 - (2) controls any pollutant not limited in the permit.
8. This Board's Order No. 74-151 is hereby rescinded.
9. This Order includes Items 1, 3, 5, and 7 of the attached "Reporting Requirements" dated August 8, 1973.
10. This Order includes Items 1, 2, 4, 5, 6, 7, 8, 9, and 11 of the attached "Standard Provisions" dated August 8, 1973, as amended.
11. This Order expires on November 18, 1979, and the discharger must file a Report of Waste Discharge in accordance with Title 23, California Administrative Code, not later than 180 days in advance of such date as application for issuance of new waste discharge requirements.
12. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the discharger, the discharger shall notify the succeeding owner or operator of the existence of this Order by a letter, a copy of which shall be forwarded to this Board.

I, Fred H. Dierker, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on March 21, 1978.

FRED H. DIERKER
Executive Officer

Attachments:

Rept. Require. 8/8/73
Std. Provn. 8/8/73 as amended
Self-Monitoring Program

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM
FOR

Chevron, USA

Richmond Refinery

Richmond, Contra Costa County

NPDES NO. CA 0005134

ORDER NO. 78-18

CONSISTS OF

PART A , dated 1/78

AND

PART B

PART B

I. DESCRIPTION OF SAMPLING STATIONS

A. INFLUENT

<u>Station</u>	<u>Description</u>
I-001	At any point in the intake line supplying once-through cooling water such that the sample is representative of the intake water.

B. EFFLUENT

<u>Station</u>	<u>Description</u>
E-001 Process Water Effluent	At any point in the discharge line from No. 2 oxidation pond such that the sample is representative of the treated process water.
E-002 Segregated Salt Water	At any point in the 250-foot Channel far enough up stream to avoid mixing segregated salt water with process water effluent.
E-003 Combined Effluent	At any point immediately above the 250-foot Channel Dam such that the sample is representative of the mixture of segregated salt water and treated process water.

C. RECEIVING WATERS

<u>Station</u>	<u>Description</u>
C-A	At a point in the 250-foot channel, located within 200 feet offshore from Outfall 001.
C-A1	At a point in Castro Creek, located at the confluence with the 250-foot channel.
C-A2	At a point in Castro Creek located 250 feet southeasterly of Station C-A1.
C-20d	At a point in San Pablo Bay, located in the entrance channel to Castro Creek, within the limits of the southwesterly quarter of grid square No. 20.
C-23d	At a point in San Pablo Bay, located within the limits of the southwesterly quarter of grid No. 23.
C-28d	At a point in San Pablo Bay, located in the entrance channel to Castro Creek, within the limits of the southwesterly quarter of grid square No. 28.
C-31b	At a point in San Pablo Bay, located within the limits of the north ^{ea} sterly quarter of grid square No. 31.
C-47a	At a point in San Pablo Bay, located within the limits of the northwesterly quarter of grid square No. 47.

C. RECEIVING WATERS (continued)

<u>Station</u>	<u>Description</u>
C-48d	At a point in San Pablo Bay, located within the limits of the southwesterly quarter of grid square No. 48.

D. SEDIMENTS

<u>Station</u>	<u>Description</u>
B-A1	At a point in Castro Creek, located at the confluence with the 250-foot channel.
B-28d	At a point in San Pablo Bay, located in the entrance channel to Castro Creek, within the limits of the southwesterly quarter of grid square No. 28, per attached drawing (corresponds with Station C-28d).
B-39b	At a point in San Pablo Bay, located within the limits of the northeasterly quarter of grid square No. 39, per attached drawing (corresponds with Station C-39b).
B-48d	At a point in San Pablo Bay, located within the limits of the southwesterly quarter of grid square No. 48, per attached Drawing (corresponds with Station C-48d).

E. LAND OBSERVATIONS

<u>Station</u>	<u>Description</u>
P-1	At the point of discharge to Castro Creek.

F. MISCELLANEOUS REPORTING

The discharger shall record the rainfall on each day of the month. At the end of each month the Total 001 Effluent limit shall be calculated on Form S (attached) as shown. Form S shall be submitted with the monthly monitoring report.

The daily volume of storm runoff discharge shall be defined as the process waste treatment system effluent flow (Waste 001) in excess of the estimated process waste flow. Estimated process waste flow shall be defined as:

1. The average discharge during the week prior to the storm event when such events are preceded by 2 weeks without rainfall.
2. At all other times, the average process waste treatment system effluent discharge during the months of normal plant operation of the preceding dry weather season. Daily storm runoff discharge may be recorded until effluent flow rates are reduced to the higher of the two flow rates described in 1 and 2 above.

II. SCHEDULE OF SAMPLING AND ANALYSIS

A. The schedule of sampling and analysis shall be that given as Table I.

I, Fred H. Dierker, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Regional Board Order No. 78-18.
2. Does not include the following paragraphs of Part A: C.3, D.4, and E.4.
3. Has been ordered by the Executive Officer on March 21, 1978, and becomes effective immediately.
4. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger and revisions will be ordered by the Executive Officer.

FRED H. DIERKER
Executive Officer

Attachments:

Table I
Drawing
Form S

TABLE I
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	E-001		E-002		E-003			C-A1	C-A2	C-20d	C-23d	C-28d	C-31b
TYPE OF SAMPLE	C-24	G	C-24	G	C-24	G		G	G	G	G	G	G
Flow Rate (mgd)	D				D								
BOD, 5-day, 20° C, or COD (mg/l & kg/day)	W												
Chlorine Residual & Dosage (mg/l & kg/day)													
Settleable Matter (ml/1-hr. & cu. ft./day)		W											
Total Suspended Matter (mg/l & kg/day)	W				M								
Oil & Grease (mg/l & kg/day)		W(1)											
Coliform (Total or Fecal) (MPN/100 ml) per req't													
Fish Toxicity, 96-hr. TL ₅₀ % Survival in undiluted waste	M				M								
Ammonia Nitrogen (mg/l & kg/day)	W												
Nitrate Nitrogen (mg/l & kg/day)													
Nitrite Nitrogen (mg/l & kg/day)													
Total Organic Nitrogen (mg/l & kg/day)													
Total Phosphate (mg/l & kg/day)													
Turbidity (Jackson Turbidity Units)					M			M	M	M	M		
pH (units)					cont			M	M	M	M	M	M
Dissolved Oxygen (mg/l and % Saturation)					M			M	M	M	M	M	M
Temperature (°C)					cont			M	M	M	M	M	M
Apparent Color (color units)													
Sulfides, (2) Total (mg/l & kg/day)		W											
Sulfides (2) Dissolved (mg/l)								M	M		M		
Arsenic (mg/l & kg/day)													
Cadmium (mg/l & kg/day)	Y												
Chromium, Total (mg/l & kg/day)	W				W (4)								
Copper (mg/l & kg/day)	Y												
Cyanide (mg/l & kg/day)	Y												
Silver (mg/l & kg/day)													
Lead (mg/l & kg/day)	Y												

TABLE I (continued)
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	E-001		E-002		E-003			C-A1	C-A2	C-20d	C-23d	C-28d	C-31b
TYPE OF SAMPLE	C-24	G						G	G	G	G	G	G
Mercury (mg/l & kg/day)	Y												
Nickel (mg/l & kg/day)	Y												
Zinc (mg/l & kg/day)	Y												
PHENOLIC COMPOUNDS (mg/l & kg/day)	W												
All Applicable Standard Observations								M	M	M	M	M	M
Bottom Sediment Analyses and Observations													
Total Identifiable Chlorinated Hydrocarbons (mg/l & kg/day)													
TOC	W		W										
Cr +6	W												
NH ₄ OH, undissociated as N, mg/l					M			M	M	M	M	M	M
Chloride	Y												
Observations								D (3)					

LEGEND FOR TABLE

TYPES OF SAMPLES

G = grab sample
 C-24 = composite sample - 24-hour

 Cont = continuous sampling

 BS = bottom sediment sample
 O = observation

TYPES OF STATIONS

I = influent station
 E = waste effluent stations
 C = receiving water stations
 P = treatment facilities perimeter stations
 L = basin and/or pond levee stations
 B = bottom sediment stations

FREQUENCY OF SAMPLING

D = once each day
 W = once each week
 M = once each month
 Y = once each year

2/Y = once in March and
 once in September
 Q = quarterly, once in
 March, June, Sept.
 and December

Cont = continuous

- (1) 3 Grab Samples per sampling day
- (2) Receiving Water analysis for sulfides should be run when DO < 5.0 mg/l
- (3) Effluent standard observations at both sides of underflow weir at confluence of 250-foot channel with Castro Creek.

- (4) Monitoring at this station may be discontinued after March 21, 1979 if calculated mass emissions are consistent with those calculated at station E-001.

TABLE I
SCHEDULE FOR SAMPLING, MEASUREMENTS, AND ANALYSIS

Sampling Station	<div> <div>B-A-1</div> <div>C-47aC-48aB-28d B-39bP-1I-001</div> <div>B-48d</div> </div>												
	G	G	G	O									
Flow Rate (mgd)													
BOD, 5-day, 20° C, or COD (mg/l & kg/day)													
Chlorine Residual & Dosage (mg/l & kg/day)													
Settleable Matter (ml/1-hr. & cu. ft./day)													
Total Suspended Matter (mg/l & kg/day)													
Oil & Grease (mg/l & kg/day)													
Coliform (Total or Fecal) (MPN/100 ml) per req't													
Fish Toxicity, 96-hr. TL ₅₀ % Survival in undiluted waste													
Ammonia Nitrogen (mg/l & kg/day)													
Nitrate Nitrogen (mg/l & kg/day)													
Nitrite Nitrogen (mg/l & kg/day)													
Total Organic Nitrogen (mg/l & kg/day)													
Total Phosphate (mg/l & kg/day)													
Turbidity (Jackson Turbidity Units)													
pH (units)	M	M											
Dissolved Oxygen (mg/l and % Saturation)	M	M											
Temperature (°C)	M	M											
Apparent Color (color units)													
Secchi Disc (inches)													
Sulfides (if DO < 5.0 mg/l) Total & Dissolved (mg/l)													
Arsenic (mg/l & kg/day)													
Cadmium (mg/l & kg/day)													
Chromium, Total (mg/l & kg/day)													
Copper (mg/l & kg/day)													
Cyanide (mg/l & kg/day)													
Silver (mg/l & kg/day)													
Lead (mg/l & kg/day)													

[illegible][illegible]

MONTH YEAR

A		
	Rainfall (inches)	
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
Total		
Mon. Aver.		

CALCULATION OF TOTAL EFFLUENT LIMITS

	MONTHLY AVERAGE STORM FLOW	STORM WATER		lbs/day ALLOCATION	A3 EFFLUENT		TOTAL 001 EFFLUENT LIMIT (lbs/day)
		ALLOCATION FACTOR x (lbs/1,000 Gal.)	=		LIMITS lbs/day	=	
30-DAY AVERAGE	BOD5	x	0.21	=	+	4670	=
	TSS	x	.17	=	+	3850	=
	TOC	x	.46	=	+	10200	=
	O&G	x	0.067	=	+	1460	=
MAXIMUM DAILY		STORM WATER		lbs/day ALLOCATION	A3 EFFLUENT		TOTAL 001 EFFLUENT LIMIT (lbs/day)
	MAXIMUM STORM FLOW FOR ANY ONE DAY (FROM COLUMN B)	ALLOCATION FACTOR =	LIMITS		=		
		x	(lbs/1,000 Gal.)	=	+	lbs/day	=
	BOD5	x	0.40	=	+	8800	=
	TSS	x	.26	=	+	6040	=
	TOC	x	.88	=	+	19,400	=
	O&G	x	0.126	=	+	2750	=